APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/704,649	11/02/2000	Sinha Navin Kumar	JP920000155US1	4492

30449 7590 05/11/2005		

SCHMEISER, OLSEN + WATTS
3 LEAR JET LANE
SUITE 201
LATHAM, NY 12110

EXAMINER
CHANG, SUNRAY

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _26 April 2005_.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
     closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

     1.☐ Certified copies of the priority documents have been received.

     2.☐ Certified copies of the priority documents have been received in Application No. _____.

     3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
      Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
      Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in responsive to the paper filed on April 26th, 2005.

2.   Claims 1 – 20 are presented for examination.

        Claims 1 – 20 are rejected.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
requirements of this title.

3.   **Claims 1 – 20 are rejected under 35 U.S.C. 101** because the claimed invention lacks

patentable utility. Specifically, *claims 1, 7, 8, 14, 15 and 18 drawn to* a method for optimizing

computer software. *The Examiner submits that Applicant's have not* <u>recited</u> *any limitations*

relating to a practical application in the technological arts. (see MPEP 2106)

        An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts"

when it is a machine, manufacture, process or composition of matter, which produces a concrete,

tangible, and useful result. The fundamental test for patent eligibility is thus to determine

whether the claimed invention produces a **"useful, concrete and tangible result."** The test for

practical application as applied by the examiner involves the determination of the following

factors:

(1) "Useful" – The Supreme Court in Diemond v. Diehr requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished.

(2) "Tangible" – Applying In re Warmerdam, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefor, is nonstatutory under 35 U.S.C. § 101. In Warmerdam the abstract idea of a data structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.

(3) "Concrete" – Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. § 101 should be accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.

The examiner respectfully submits, under current PTO practice, the claimed invention can be done by hand, analyzing, identifying, recording, scanning, and modifying through hand-drawing a flow chart.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   **Claims 1, 2, 5, 6, 8, 9, 12, 13, 15 – 17, 19, and 20 are rejected** under 35 U.S.C. 102(b)

as being anticipated by Andrew E. Ayers (U.S. Patent No. 5,857,105, and referred to as **Ayers**

hereinafter).

5.   **Regarding independent claims 1, 8 and 15,**

        Ayers teaches,

- A method for optimizing computer software [Col. 1, Lines 5 – 10] that includes one or more call statements [caller, Col. 2, Line 36] and a procedure [callee's routine, Col. 2, Line 37] which is callable by the or each call statement [caller, Col. 2, Line 36] and which has two or more [Fig. 2] code branches [callee, Col. 2, Lines 57 – 58] and control flow code [caller's code listing, Col. 2, Line 57] for directing program flow [program listing, Col. 2, Line 36] to the code branches [callee, Col. 2, Lines 57 – 58], [see Col. 1, Lines 5 – 10, Col. 2, Lines 35 – 59, see also Col. 3, Lines 22 – 50, and Fig. 2] the method comprising the steps of:

  (a) analyzing the procedure [Col. 2, Line 41] to identify said control flow code [caller's code listing, Col. 2, Lines 56 – 57] and said code branches [callee, Col. 2, Lines 57 – 58]; [see also Col. 2, Lines 50 – 60 and Col. 1, Lines 5 – 10]

  (b) identifying for each said code branch [callee, Col. 2, Lines 57 – 58] a new procedure [replaces] containing the respective code branch [callee, Col. 2, Lines 57 – 58]; [see also Col. 1, Line 10]

  (c) recording a list of data entries [source listing, Col. 1, Line 7] corresponding to the respective new procedures [replaces, Col. 1, Line 10], each entry comprising a data

item identifying the respective new procedure [executable object code, Col. 1, Line 9] and a data item representative of the branch conditions [indirect/ direct, Col. 2, Lines 37 – 38] under which said control flow code [caller's routine, Col. 2, Line 43] directs program flow to the associated code branch [callee, Col. 2, Line 43]; [see also Col. 1, Lines 5 – 10, and Col. 2, Lines 35 – 59]

(d) for the or each call statement [caller, Col. 2, Line 36], scanning the entries in said list [source listing, Col. 1, Line 7] to determine one for which there is correspondence [a match, Col. 2, Line 44] between said branch conditions [indirect/ direct, Col. 2, Line 37 – 38] and call parameters [characteristics, Col. 2, Line 44] directed to said control flow code [caller's routine, Col. 2, Line 43] by the call statement [caller, Col. 2, Line 36] and modifying the call statement [reduces a number of indirect calls, Col. 1, Line 8 – 9] to replace [replaces, Col. 1, Line 10] the call to the original procedure by a call to the corresponding new procedure [in-line listing/direct calls, Col. 1, Line 10]. [see also Col. 1, Lines 5 – 10, Col. 2, Lines 35 – 59, Col. 3, Lines 22 – 50, and Fig. 2]

6.   **Regarding dependent claims 2 and 9,**

        Ayers teaches,

- constructing a control flow graph [constructs a global call graph, Col. 4, Line 19 – 20] for the procedure [transform procedure, Col. 4, Line 19], [Col. 4, Lines 10 – 20] the control flow graph comprising

- a branching node [callee node, Fig. 3 – 5, and Col. 4, Line 40] representative of said control flow code [caller's routine, Col. 4, Line 53] and further nodes representing respective ones of

said code branches [callee node, Col. 4, Line 53]. [see also Col. 4, Lines 38 – 65, and Fig. 3 –

5]

7.   **Regarding dependent claims 5 and 12,**

        Ayers teaches,

- including optimizing the or each new procedure [reduces, Col. 5, Line 28] for which a call

  parameter is a constant [predetermined number, Col. 5, Line 27] by propagating that constant

  through the new procedure. [see also Col. 4, Line 51 – Col. 5, Line 59]

8.   **Regarding dependent claims 6 and 13,**

        Ayers teaches,

- including analyzing [comparing, Col. 2, Line 41] a call statement [caller, Col. 2, Line 43],

  [see also Col. 2, Lines 41 – 48]

- calling parameters [characteristic, Col. 2, Line 44] and an associated new procedure [callee

  routings, Col. 2, Line 38] to determine if they are compliant with predetermined in-lining

  rules [in-lining, Col. 2, Lines 53 – 55] and, [see Col. 2, Lines 35 – 58]

- if they are so compliant, replacing said call statement by a copy of the new procedure. [see

  Col. 1, Lines 5 – 10]

9.   **Regarding dependent claims 16 and 19,**

        Ayers teaches,

- implemented in the form of a machine readable storage medium storing said computer code.

[see Col. 3, Line 27]

10.   **Regarding dependent claims 17 and 20,**

Ayers teaches,

- implemented in the form of a body of computer code made available for downloading from a

computer connected to a computer network. [Fig. 1]

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness
      or nonobviousness.

11.   **Claims 3, 7, 10, 14, and 18 are rejected** under 35 U.S.C. 103(a) as being unpatentable

over **Ayers**, and in view of Seema Hiranandani (U.S. Patent No. 5,812,855 and referred to as

Hiranandani hereinafter).

(**Ayers** as set forth above generally discloses the basic inventions.)

12.   **Regarding dependent claims 3 and 10,**

Ayers teaches,

- for each item of control flow code, before identifying any new procedure in accordance with

   step (b) of the method, checking for compliance between one or more predetermined rules

   for the software and the software should step (b) and following steps of the method take

   place; and for that item of control flow code, continuing with step (b) and the following steps

   of the method only in the event of such compliance. [signature match test, Col. 4, Line 66 –

   Col. 5, Line 18, see rejections of claim 1 for details]

Ayers does not teach a code branches itself comprises two or more code branches.

Hiranandani teaches a code branches itself comprises two or more code branches [see

Fig. 5, see also Col. 1, Lines 1 – 67], for the purpose of performing optimization on procedures.

[see **Hiranandani**, Col. 11, Lines 59 – 60]

It would have been obvious to a person of ordinary skill in the art at the time of

applicant's invention to modify the teaching of **Ayers** to include "a code branches itself

comprises two or more code branches" for the purpose of performing optimization on

procedures. [see **Hiranandani**, Col. 11, Lines 59 – 60]

13. **Regarding independent claims 7, 14 and 18,**

    Ayers teaches,

- A method for optimizing computer software that includes one or more call statements and a procedure which is callable by the or each call statement, [see Col. 1, Lines 5 – 10, Col. 2, Lines 35 – 59, see also Col. 3, Lines 22 – 50, and Fig. 2] the method comprising the steps of:

- constructing a control flow graph for the procedure, the control flow graph comprising one or more branching nodes each representative of respective control flow code and, [see Col. 4, Lines 38 – 65, Fig. 3 – 5, and Col. 4, Lines 10 – 20, see rejections of claim 2 for further detail];

- considering each node in turn [sequentially accessed, Col. 4, Line 54] and, if the node being considered is a branching node and if the branching condition for that node by which the respective control flow code directs program flow to the respective code branches is able to be represented as a function only of formal parameters [signature, Col. 5, Line 21] and global variables [Fig. 2], identifying a new procedure for which the flow control graph comprises all the nodes in the path from the first node of the procedure to the node being considered, the node being considered, and the whole of the portion of the control flow graph led to directly or indirectly [indirect/ direct, Col. 2, Lines 37 – 38] from the node being considered; [see Col. 4, Lines 51 – 65, Col. 5, Lines 10 – 31, and Col. 4, Lines 66 – Col. 5, Lines 9]

- recording a list of data entries [source listing, Col. 1, Line 7] corresponding to the respective

  new procedures, each entry comprising a data item identifying the respective new procedure

  and a data item representative of the corresponding branching condition; [Col. 1, Lines 5 –

  10, and Col. 2, Lines 35 – 59]

- for each said call statement, scanning the entries in said list to determine one for which there

  is correspondence between said branch condition and call parameters supplied by the call

  statement; and modifying the call statements to call said new procedures. [see Col. 1, Lines 5

  – 10, Col. 2, Lines 35 – 59, see also Col. 3, Lines 22 – 50, and Fig. 2]

Ayers does not teach for each branching node, two or more further nodes representing

respective code branches to which program flow is directed by the branching node.

Hiranandani teaches for each branching node, two or more further nodes representing

respective code branches to which program flow is directed by the branching node [see Fig. 5,

Col. 1, Lines 1 – 67], for the purpose of performing optimization on procedures. [see

Hiranandani, Col. 11, Lines 59 – 60].

14.   **Claims 4 and 11 are rejected** under 35 U.S.C. 103(a) as being unpatentable over **Ayers**,

and in view of Seema Hiranandani, and further in view of Uma Mahadevan (U.S. Patent No.

5,797,013 and referred to as **Mahadevan** hereinafter).

15.   **Regarding dependent claims 4 and 11,**

        Ayers teaches,

- A method for optimizing computer software that includes one or more call statements and a procedure which is callable by the or each call statement, [see Col. 1, Lines 5 – 10, Col. 2, Lines 35 – 59, see also Col. 3, Lines 22 – 50, and Fig. 2]

Ayers does not teach the application of a cost-analysis algorithm based on predetermined rules about the length of the software.

Hiranandani teaches a code branches itself comprises two or more code branches [see Fig. 5, and Col. 1, Lines 1 – 67], for the purpose of performing optimization on procedures.

Mahadevan teaches the application of a cost-analysis algorithm based on predetermined rules about the length of the software [Col. 10, Lines 46 – 52 & Lines 7 – 45] for the purpose of optimization.

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Ayers** to include "the application of a cost-analysis algorithm based on predetermined rules about the length of the software" for the purpose of optimization. [see **Hiranandani**, Col. 10, Lines 46 – 52]

Response to Amendment

Claim Rejections - 35 USC § 102

16.   Examiner has withdrawn forth rejections. Yet, new rejections have been cited based on new cited new references.

Conclusion

17.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sunray Chang whose telephone number is (571) 272-3682. The

examiner can normally be reached on M-F 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-746-3506.

Sunray Chang
Patent Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

Anthony Knight
Supervisory Patent Examiner
Group 3600

May 6, 2005